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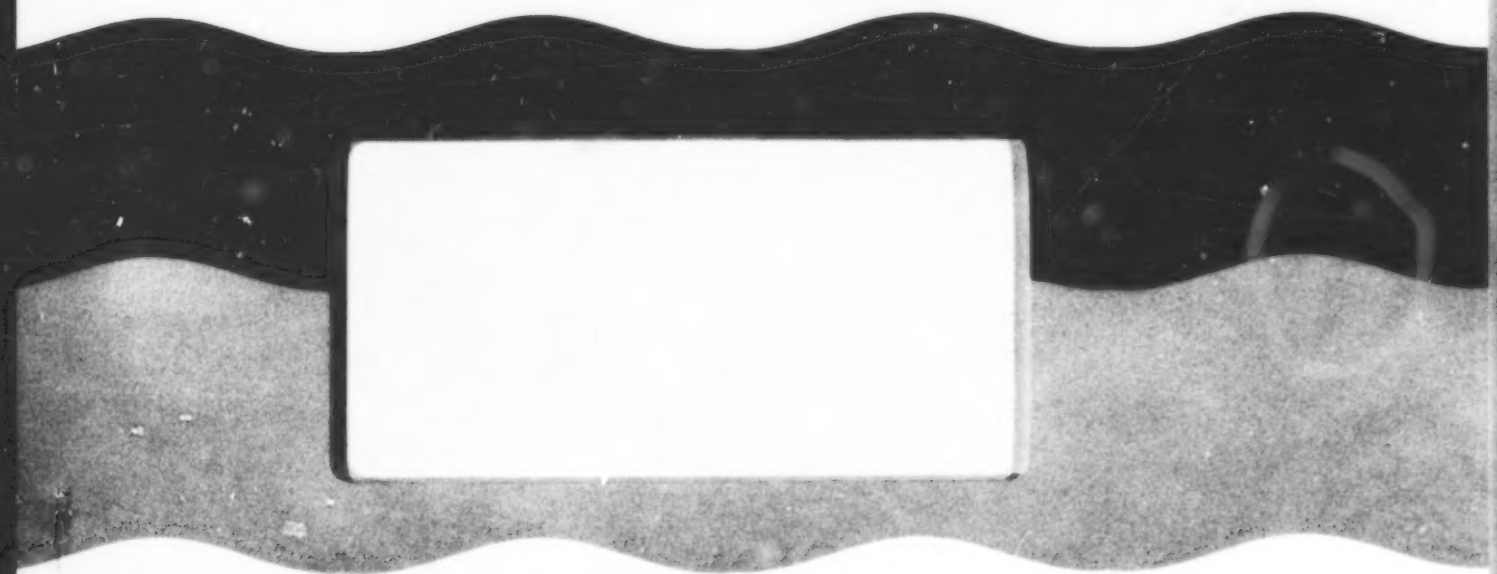
TP 1624

Marine Casualty Investigations

Enquêtes sur les accidents maritimes



Investigation Report to the Minister pursuant to sections 542 or 545 of the Canada Shipping Act

Rapport d'investigation au Ministre conformément aux articles 542 ou 545 de la Loi sur la marine marchande du Canada

Canada

Ce rapport est aussi disponible en français.

REPORT OF INVESTIGATION INTO THE CIRCUMSTANCES ATTENDING THE STRIKING OF WARPING DOLPHINS BY THE CANADIAN LAKER "ELMGLEN" IN GODERICH HARBOUR, ONT. AUGUST 26, 1986.

REPORT No. 473

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REPORT OF INVESTIGATION INTO THE CIRCUMSTANCES ATTENDING THE STRIKING OF WARPING DOLPHINS BY THE CANADIAN LAKER "ELMGLEN" IN GODERICH HARBOUR, ONT. AUGUST 26, 1986.

Particulars of vessel

Name	"ELMGLEN"
Official number	194831
Port of Registry	Port Colborne
Call sign	CYBM
Gross tonnage	13,883.8
Net tonnage	9,697.15
Length	201.29 m
Breadth	20.818 m
Depth	9.81 m
Draught (at time of incident)	3.28 m forward 5.38 m aft
Type	Bulk carrier (laker)
Construction	steel
Built	Port Weller 1952
Propulsion	one steam turbine (Allis Chalmers) of 4924 b.h.p. driving one fixed pitch propeller, engine controlled from the engine-room.
Bow Thruster	Crothers, 1000 b.h.p.
Cargo	nil-in ballast
Crew	23
Classification	American Bureau of Shipping (ABS)
Owners	P and H Shipping Mississauga, Ontario

Navigating Equipment

Radar (1)	Decca TM 1226 C, ranges .25 to 48 miles, ship's head up, non-gyro stabilized, fitted with clear-scan.
Radar (2)	Decca RM 1226, ranges .25 to 48 miles, ship's head up, non-gyro stabilized.
Direction Finder	Radio Marine Corporation of America - AR 8709 B
Echo Sounder	Furuno FE 502 Mark II visual and recorder.
Loran C	Internav LC 360
VHF(1)	Sailor, RT 144, all channels
VHF(2)	Sailor, RT 143, all channels
Gyro compass	Sperry Mark 37
Magnetic compass	Ritchie
Auto Pilot	Sperry

Description of vessel

The "ELMGLEN" is a typical laker with the navigation-bridge situated forward and engine-room aft; between the bridge and engine-room the vessel is transversely divided into 6 holds. She is double-bottomed throughout her length from fore-peak to after-peak.

On building in 1952 the vessel was named "JOHN O. McKELLAR", changing to her present name in October 1984 when purchased by her present owners.

The diesel engined bow thruster is operated from the wheel-house and there are two independent steering systems, one electric and one hydraulic.

NOTE: 1. All times in this report are expressed in Eastern Daylight Saving Time (U.T.C. minus 4 hours)

2. A glossary of abbreviations and terms together with a chartlet of Goderich Harbour can be found following the findings in this report.

Background

The "ELMGLEN" departed Port Colborne in ballast on August 24, 1986, bound for Thunder Bay, Ontario. During the morning of the 25th a change of orders directed the vessel to Goderich, Ontario in order to load a full cargo of grain.

On arrival at Goderich the following morning, August 26, at 0145 and when manoeuvring to enter the inner harbour, the vessel struck two newly constructed concrete caissons intended for use as warping dolphins on completion of the harbour's modifications and extensions.

Minor damage was incurred to the bow of the "ELMGLEN" and one dolphin was damaged, misaligned and tilted from its original position. The "ELMGLEN" then proceeded and berthed without further incident.

Cost of repairs and repositioning the damaged dolphin was estimated at 350,000 dollars whilst temporary repairs to the vessel's bow cost 7,500 dollars.

There was no injury or pollution as a result of this incident.

Narrative

The "ELMGLEN" departed Port Colborne, Ontario at approximately 0030, August 24, 1986 bound for Thunder Bay, Ontario where she was to load a cargo of bulk grain. Her condition on departure was light ship (empty of cargo) and fully ballasted with approximately 8000 tonnes of lake water contained in her ballast tanks giving a total displacement of approximately 14,500 tonnes; her draughts were 3.28 m forward and 5.38 m aft.

At 1120 on the morning of August 25, orders were received from her owners to divert to Goderich, Ontario to load a full cargo of grain. The ETA at Goderich was then calculated to be 0200 the following day, August 26.

The holds were in the process of being cleaned by the ship's crew and this was completed during the evening of the 25th.

A weather forecast for Southern Lake Huron and Georgian Bay, which includes the area of Goderich, was issued by Environment Canada and transmitted by Sarnia Coast Guard Radio at 1800, August 25, and read in part:

Winds southerly 10 to 15 knots increasing 15 to 20 tonight...waves around 1.0 m increasing to 1.0 to 1.5 tonight.

The next forecast issued from the same source at 2300, August 25 read in part:

Winds southwesterly 15 knots...waves 1.0 to 1.5 m increasing to 1.5 m overnight.

The above messages were received by the "ELMGLEN" and proved correct with the actual conditions on arrival off Goderich, at approximately 0130, August 26th, found to be, winds south-south-west 15 knots, overcast, visibility 10 miles, seas approximately 1 m.

Goderich Harbour is a compulsory pilotage area for vessels of 300 gross registered tonnage and above and which are not Canadian or United States flag vessels and whose masters do not have the required qualifications. However the "ELMGLEN" is a Canadian ship and her master had the required qualifications. Consequently it was decided by him to undertake his own pilotage for the approach and entrance to the harbour; the ship's bridge was then manned as follows:

- the master - piloting by visually sighting range lights and directing the helmsman to steer the required courses, also adjusting speed, by use of the engine-room telegraph, to maintain approximately 4 knots through the water.

- the third mate - assisting the master.

- the helmsman - hand steering by use of the electric steering system as directed by the master.

The 1st and 2nd mates were stationed forward and aft respectively preparing the mooring ropes and advising the master, by portable radio telephone, of distances off navigational hazards, buoys, etc.

The number 1 Radar was switched on but not in use when approaching and entering the harbour, pilotage being made visually in the night-time conditions.

When approaching the harbour entrance and on the ranges steering 087° T&G the vessel was found to be setting to the north under the influence of the south-south-westerly wind and a northerly set of current. Course was then altered to starboard in order to counteract the northerly set and drift.

As the vessel entered the outer harbour and the bow passed between the two breakwaters the stern was observed to be setting up towards the outer end of the northern breakwater; in order to avoid striking it the helm was then put to hard-a-port and the stern canted to starboard clearing the breakwater, however, the above manoeuvre had caused the vessel to turn to port of the ranges and out of the channel.

An alteration of helm to hard-a-starboard and an increase of engine revolutions to full ahead together with the use of the bow thruster failed to bring the vessel back into the channel and when contact with the dolphins was observed to be inevitable, both bow anchors were let go and the main engine put to full astern.

The "ELMGLEN" struck the first dolphin with the port side of her bow and then the second dolphin with her stem, both occurring as the vessel's speed reduced from an estimated 4 knots to about 2 knots. Damage to the first dolphin struck was negligible; however, repairs to the second dolphin (struck by the stem) together with its repositioning, were estimated to be approximately 350,000 dollars.

Damage to the "ELMGLEN" consisted of an indentation to her port bow of approximately 25 cm over an area of approximately 4 m x 4 m together with buckled frames and stringers. There was no damage to her stem. Temporary repairs at a cost of 7,500 dollars were made allowing the vessel to remain in class with her classification society.

A report was made by the ship to her owners at 0830 the same day but the incident was not reported by the ship to the Canadian Coast Guard or other Federal Government Authority.

Analysis

1. Manoeuvrability of "ELMGLEN"

The "ELMGLEN" is propelled by a steam turbine engine which drives one fixed pitch propeller. The engine is operated from the engine-room in response to orders made by telegraph from the bridge. The time interval from full ahead to full astern is reported to be 30 to 35 seconds. At light ship draught and at a speed of 4 knots a further several minutes would be required to bring the ship to a stop when using engines alone and without the assistance of anchors or tugs.

2. Manoeuvring room, Goderich Harbour

The entrance to the outer harbour is 168 m wide between

the extremities of the two breakwaters; the length of the "ELMGLEN" is 201.29 m, her breadth being 20.82 m.

The distance from the entrance to the first dolphin struck is approximately 503 m, therefore, at a speed of 4 knots, the time elapsed from the time the bow passed the entrance to striking the first dolphin would have been approximately 4 minutes. During that time the helm had been altered to hard-a-port and then to hard-a-starboard and the engines from slow ahead to full ahead and then to full astern.

In the absence of recorded times of positions and engine movements the above is based on remembered testimony only. Records such as a bridge note book and an engine movement book would have provided more accurate information but typically for most Great Lake vessels, none were kept.

Checking the position of the "ELMGLEN" when she struck the first dolphin with the port side of her bow and then the second dolphin with her stem would indicate that she may have grounded astern. Chart soundings in that position indicate a depth of 15 to 16 feet (4.6 to 4.9 m) whereas the "ELMGLEN" drew 5.38 m aft. There was no evidence of grounding and it is known that south-westerly winds can increase the depths of water at Goderich well in excess of those indicated on the chart.

3. Navigational Aids, Goderich Harbour

Reportedly all navigational aids were in position and operating; range lights consisting of 2 fixed red lights vertically spaced 0.6 m apart are situated at the south-western corner of the north pier with another fixed red light to the east. The dolphins were not lit but are sufficiently far to the north to be cleared by a vessel entering the harbour on the ranges and then altering course to starboard when aligned with the entrance to the inner harbour (see chartlet, Goderich Harbour).

Although it was at night and they were unlit, the dolphins were discernible when the vessel was inside the harbour.

The northern and southern extremities of the channel through the outer harbour are marked by unlit steel spar buoys known as "Ottawa River type" buoys. They are cylindrical, measuring approximately 2.14 m in length and 34 cm in diameter. When in position, they project

approximately 1 m above the surface.

One of these buoys, buoy VX5, to the north of the channel, was no longer visible at a time after the "ELMGLEN" had struck the dolphins and it was replaced by another identical buoy during August 29, three days later.

From the above, it would seem the "ELMGLEN" over-rode buoy VX5 prior to striking the dolphins, however, there is no evidence of this and the buoy had not been observed from the "ELMGLEN".

4. Navigating Equipment "ELMGLEN"

The vessel's navigating equipment and machinery were in good condition with no malfunctions either during or prior to the incident. The chart in use was C.H.S. 2291 entitled "Goderich to/A Chantry Island"; it was the appropriate chart corrected up to date and had an inset plan of Goderich Harbour showing the range lights and course to steer in order to enter the outer harbour at a position midway between two breakwaters. (see chartlet, Goderich Harbour). The dolphins and extensions to the harbour were not indicated on the chart and a Notice to Mariners concerning them had not been issued; however, the master was fully aware of their existence and positions.

Notices to Shipping and Notices to Mariners were apparently not issued due to the dolphins being situated to the north of the channel and outside the area in which ships would normally be expected to navigate.

5. Dolphins, Damage and Construction

The "ELMGLEN" sustained damage to her port bow on striking the first dolphin causing negligible damage to the dolphin. She sustained no damage to her stem on striking the second dolphin but caused damage to the second dolphin and moved it approximately 25 cm from its original position, also slightly tilting it.

The dolphins are rectangular, concrete structures approximately 7.5 m square and several metres deep which were floated into position and then filled with gravel ballast until resting on the harbour bed. Gravel and rock fill was then dumped beside and behind them to form the basis of the new "warping jetty". This process was on-going at the time of the incident, the total fill not being completed.

6. **Bow Thruster "ELMGLEN"**

The vessel was at her ballast draught of 3.28 m forward which placed the bow thruster just below the surface of the water where the water pressure would be minimal, considerably reducing the effect of its thrust. In addition, bow thrusters begin to lose their effectiveness at vessel speeds in excess of 2 knots.

7. **Use of Anchors**

When it became obvious that the dolphins could not be avoided by use of the engine and helm alone, both bow anchors were let go and paid out to 1 shackle (27 m) on deck. The depth of water at the dolphins varies from 5 m to 7.5 m and this action assisted in slowing the forward motion of the vessel and reducing the force of impact.

8. **Currents, Goderich**

There is no published information on the directions and rates of currents off Goderich Harbour. The Canadian Hydrographic Service publication entitled "Sailing Directions, Great Lakes, Volume II" contains information on the changing water levels of Lake Huron which indicates the existence of currents but no details of such currents are included.

Local knowledge indicates that currents off the entrance to Goderich Harbour are variable in direction and rate and influenced by many factors such as rainfall, evaporation, wind direction, local storms, etc., rendering them very difficult to predict.

The master of the "ELMGLEN" felt that his ship was under the influence of a strong northerly set of current because she was being moved to the northward far faster than he would have expected if she were under the influence of the wind alone.

9. **Ballast condition**

The "ELMGLEN" was ballasted by use of all her ballast tanks. She was not additionally ballasted by use of the holds which are capable of taking water ballast. Additional ballast would have increased the draught and reduced leeway caused by the wind (but not the set caused by the current) and would also have increased the effectiveness of the bow thruster. Consideration had been given to ballasting the holds but the weather

conditions were such that it was not considered necessary.

In any case there is a natural reluctance on the part of shipmasters to use the vessel's holds for ballast water when a dry bulk cargo is to be loaded. Drying out the holds can lead to expensive delays to the loading operation.

10. Report of a Marine Casualty

The casualty was not reported to the Canadian Coast Guard but was reported to the vessel's owners at 0830 the same day.

The Shipping Casualties Reporting Regulations made pursuant to section 543 of the Canada Shipping Act require the immediate reporting by radio or telephone of all shipping casualties, dangerous occurrences, accidents, deaths and disappearances of persons from ships followed by the completion of written report forms.

Advice of the casualty was received by Marine Casualty Investigations from Harbours and Ports, Transport Canada, when the latter became aware of the accident.

11. Crew Qualifications and Experience

The master of the "ELMGLEN" held a Canadian CNI certificate issued at Toronto in 1982. He joined his employers in 1975 and was promoted to master in 1982. He had held command of the "ELMGLEN" for 2 years and had arrived and departed from Goderich approximately 30 times but only twice when in command of the "ELMGLEN", the other times were as master of more engine-responsive vessels.

The 1st mate held a CNI certificate issued at St. Catharines in 1983 and had 20 years seafaring experience, all on the Great Lakes and Seaway, and had been 1st mate of the "ELMGLEN" for the past 2 years.

The helmsman held no marine qualifications nor was he required to by regulation. He had 8 years seafaring experience, 2 months experience as helmsman and had been helmsman of the "ELMGLEN" for 1 week.

Findings

When entering Goderich Harbour, Ontario, during the

early morning of August 26th, 1986, in good weather conditions with good visibility although in darkness, the Canadian Laker "ELMGLEN", due to a navigational error, struck two concrete dolphins forming part of the new harbour modifications and extensions. Minor damage was incurred to the "ELMGLEN" and extensive damage and misalignment to one dolphin.

It would appear that the striking occurred due to the following factors.

- the rate of a northerly set of current outside the harbour was misjudged as the vessel approached the harbour causing the vessel to cant across the channel as she entered, and

- being steam turbine, the main engine manoeuvring process is relatively slow.

Other Findings

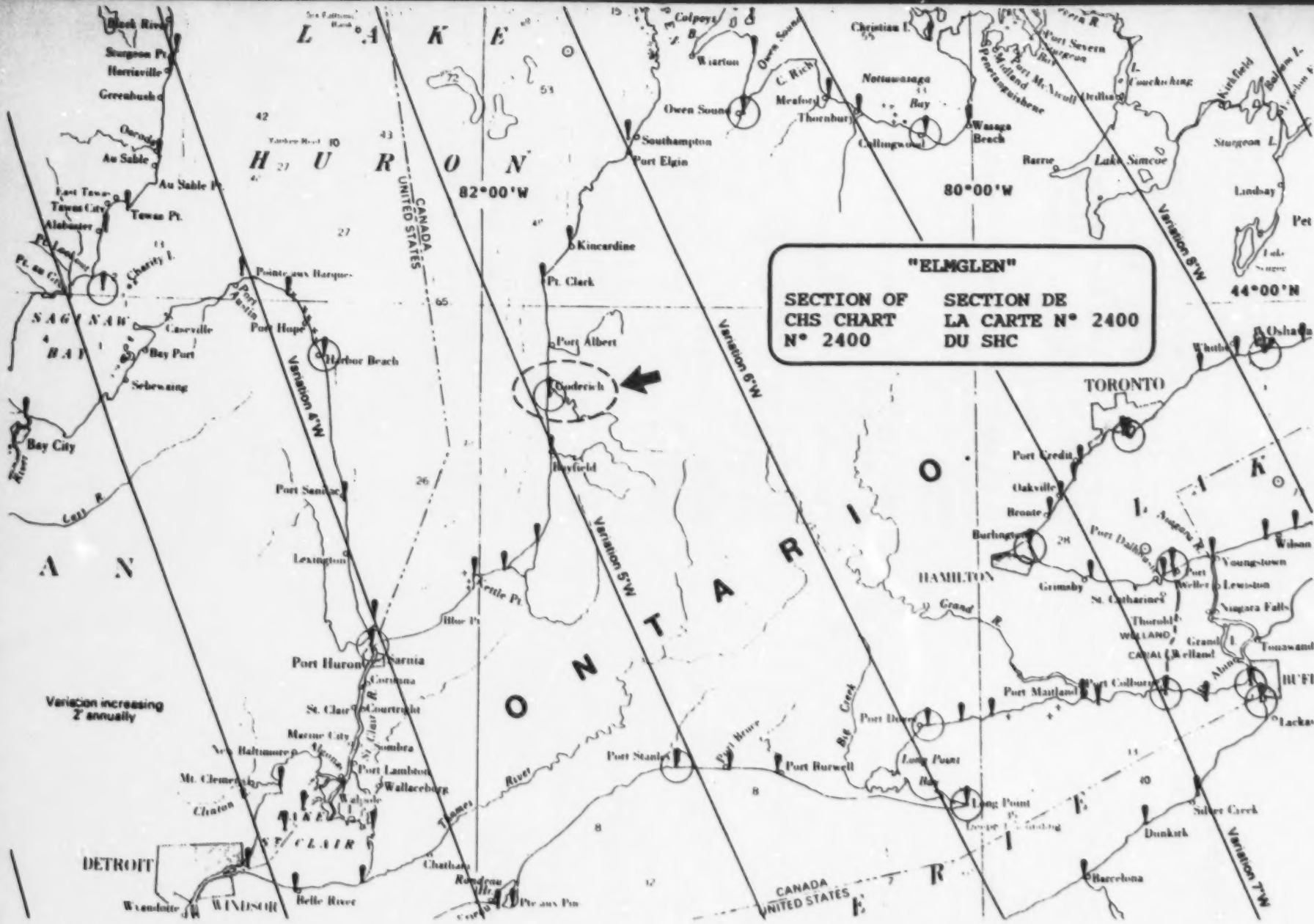
The prompt use of the bow anchors reduced the force of impact thus reducing the extent of damage.

The incident was not reported as required by the Shipping Casualties Reporting Regulations.

OTTAWA, ONTARIO
MAY 1987.

Glossary

Bow thruster	Propeller placed in the bow to give lateral thrust. Assists manoeuvrability.
Dolphin	A structure used for mooring and as a fender. Placed either apart from or integral with a wharf.
Displacement	The number of tonnes of water displaced by a vessel afloat, equal to the vessel's actual weight.
Draught	The depth of a vessel below the waterline.
ETA	Estimated time of arrival.
Notices to Mariners	Printed, promulgated messages relating to hazards to shipping.
Notices to Shipping	Radio broadcast messages relating to hazards to shipping.
Range lights	Lights placed in line to indicate a course to steer as an aid to navigation.
UTC	Co-ordinated Universal Time
Warping	To move a vessel by use of mooring lines with or without the assistance of the main engine(s).


"ELMGLEN"
SECTION OF CHS CHART N° 2400
SECTION DE LA CARTE N° 2400 DU SHC
LAKE HURON
LAKE ONTARIO
82°00'W
80°00'W
44°00'N
CANADA
UNITED STATES
Variation 6°W
Variation 5°W
Variation 7°W
Variation increasing 2' annually
Sturgeon Pt.
Harrisville
Greenbush
Oscoda
Au Sable
Au Sable Pt.
East Tawas
Tawas City
Alabaster
Tawas Pt.
Pt. au Gres
Charity I.
SAGINAW BAY
Caseville
Bay Port
Sebewaing
Bay City
Pointe aux Barques
Port Austin
Port Hope
Harbor Beach
Port Sanilac
Lexington
Port Huron
Sarnia
Courtright
St. Clair R.
Marine City
Mt. Clemens
Port Lambton
Wallaceburg
Clinton
Thames River
ST. CLAIR
DETROIT
Wyandotte
WINDSOR
Belle River
Chatham
Pt. aux Pin
Colpoys B.
Wiarton
Owen Sound
Meaford
Thornbury
Collingwood
Southampton
Port Elgin
Kincardine
Pt. Clark
Port Albert
Goderich
Bayfield
Nottawasaga Bay
Wasaga Beach
Christian I.
Port Severn
Midland
Port McNicoll
Penetanguishene
Orillia
Barrie
Lake Simcoe
Sturgeon L.
Lindsay
Oshawa
TORONTO
Port Credit
Oakville
Burlington
HAMILTON
Grimsby
St. Catharines
Port Dalhousie
Port Weller
Niagara R.
Youngstown
Lewiston
Niagara Falls
Thorold
WELLAND CANAL
Grand R.
Tonawanda
BUFFALO
Port Colborne
Port Maitland
Port Dover
Port Stanley
Big Creek
Kettle Pt.
Port Burwell
Long Point
Long Point Bay
Silver Creek
Dunkirk
Barcelona

GODERICH HARBOUR

Surveyed by the Department of Public Works and the Canadian Hydrographic Service to 1979.

Levé par le ministère des Travaux publics et le Service hydrographique du Canada jusqu'à 1979.

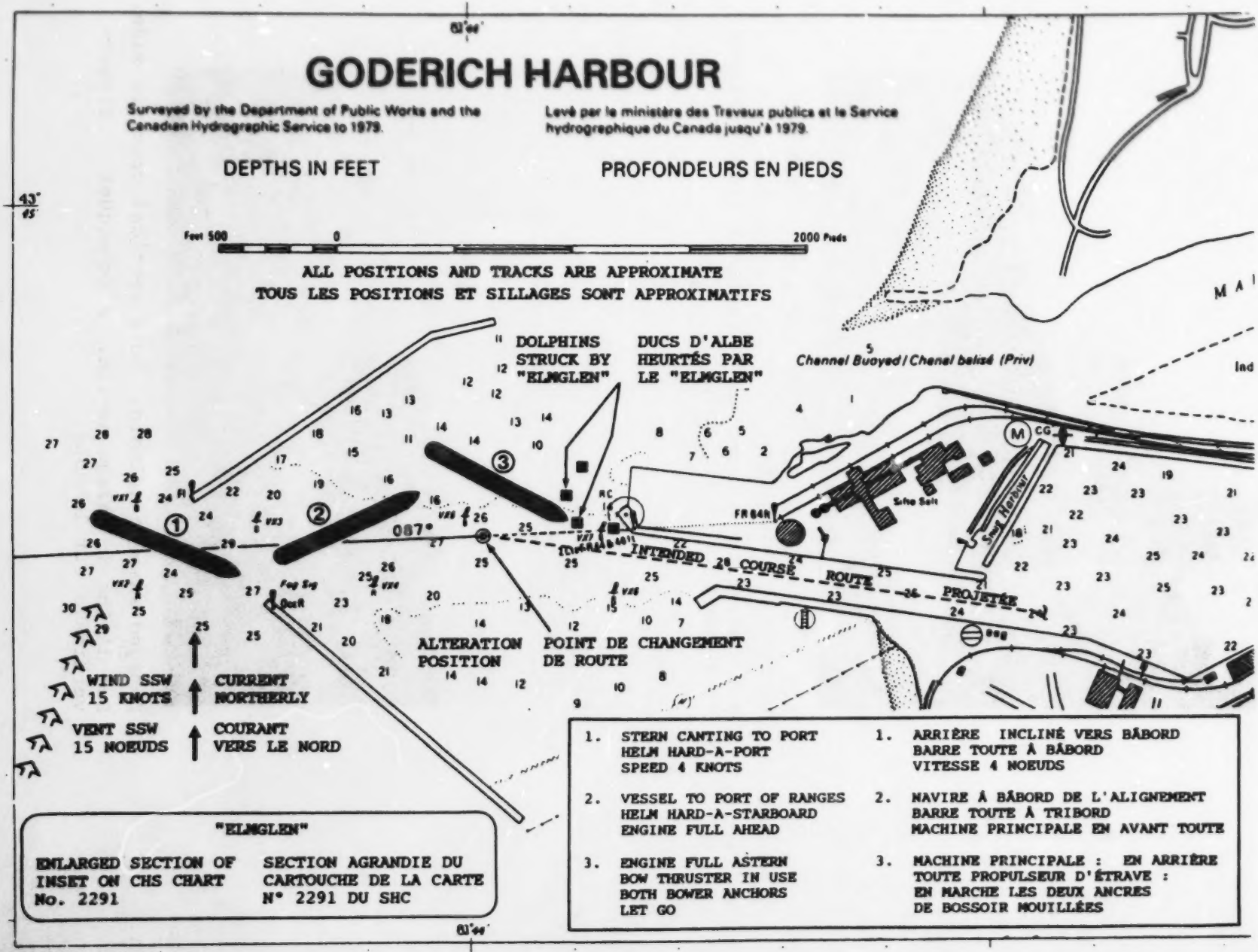
DEPTHS IN FEET

PROFONDEURS EN PIEDS

Feet 500 0 2000 Feet

ALL POSITIONS AND TRACKS ARE APPROXIMATE

TOUS LES POSITIONS ET SILLAGES SONT APPROXIMATIFS



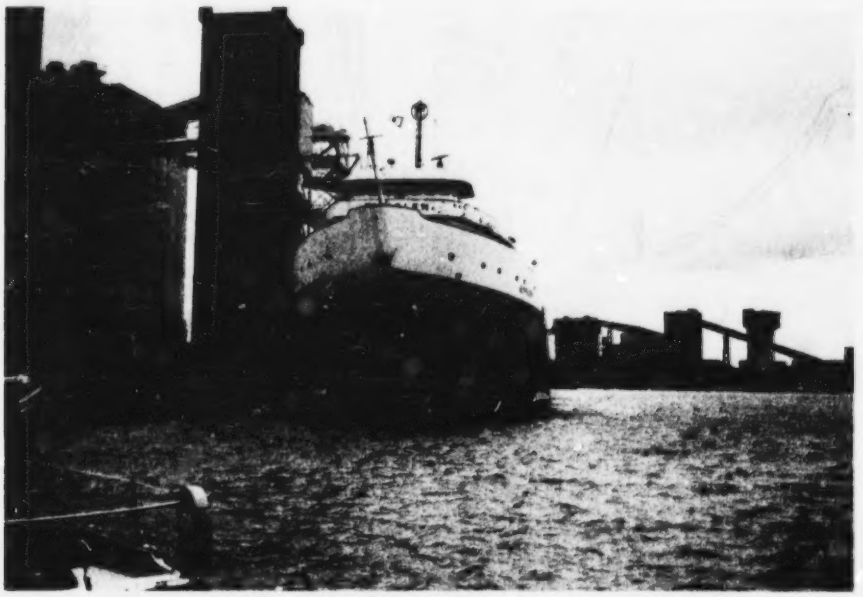
"ELMGLEN"

ENLARGED SECTION OF INSET ON CHS CHART No. 2291

SECTION AGRANDIE DU CARTOUCHE DE LA CARTE N° 2291 DU SHC

1. STERN CANTING TO PORT
   HELM HARD-A-PORT
   SPEED 4 KNOTS
2. VESSEL TO PORT OF RANGES
   HELM HARD-A-STARBOARD
   ENGINE FULL AHEAD
3. ENGINE FULL ASTERN
   BOW THRUSTER IN USE
   BOTH BOWER ANCHORS
   LET GO

1. ARRIÈRE INCLINÉ VERS BÂBORD
   BARRE TOUTE À BÂBORD
   VITESSE 4 NOEUDS
2. NAVIRE À BÂBORD DE L'ALIGNEMENT
   BARRE TOUTE À TRIBORD
   MACHINE PRINCIPALE EN AVANT TOUTE
3. MACHINE PRINCIPALE : EN ARRIÈRE TOUTE PROPULSEUR D'ÉTRAVE : EN MARCHE LES DEUX ANCRES DE BOSSOIR MOUILLÉES



S.S. "ELMGLEN" at Goderich. Damage to port bow visible at waterline.

N.V. "ELMGLEN" à Goderich. Avaries à l'avant bâbord visibles à la flottaison.

Damaged warping dolphin. Note vertical crack on side.

Duc d'Albe de halage avarié. À remarquer : fissure verticale sur le côté.